Chapter 2. Alternatives

2.1 Introduction to the Alternatives

This chapter describes the process used to develop alternatives to the Proposed Action (i.e., development and implementation of a CCP), similarities among the alternatives, a detailed description of each alternative, and a summary comparison of the alternatives by each of the primary issues. The Proposed Action and the primary issues are described in Chapter 1, Sections 1.2 and 1.8, respectively. Appendix G includes Compatibility Determinations for each secondary use proposed, which is required to ensure that all uses are compatible with Refuge purposes.

2.1.1 Alternatives Development

NEPA requires Federal agencies to evaluate a full range of reasonable alternatives to a Proposed Action. The alternatives should meet the purpose and need of the proposal while minimizing or avoiding detrimental environmental effects. The NEPA alternative development process allows the Service to work with the public, stakeholders, interested agencies, and tribes to formulate alternatives that respond to identified issues. This CCP/EIS documents the Service's planning and decision process for the CCP.

Eight preliminary habitat restoration alternatives were developed and presented to the public in an Issues Workbook at two public meetings in 1997. Comments received on the preliminary set of alternatives and throughout the public scoping process, as well as input from a series of scientific and public use workshops, ultimately resulted in the four draft management alternatives presented in this CCP/EIS. These include a "no action" alternative (as required under NEPA) and three "action" alternatives, each of which describes several options for managing Nisqually NWR over the next 15 years and would ultimately result in different future conditions at the Refuge. Each alternative describes a combination of habitat and public use management prescriptions designed to achieve the Refuge purpose, goals, and vision. These alternatives provide different ways to address and respond to major public issues, management concerns, and opportunities identified during the planning process. All of the major issues, activities, and management concerns were evaluated and addressed for each alternative. The four alternatives are listed below and described in detail in Section 2.3.

- **Alternative A—No Action: Status Quo** – This alternative assumes no change from past management programs and is considered the base from which to compare the other alternatives. There would be no changes to the Refuge boundary and no major changes in habitat management or public use programs.

- **Alternative B—Refuge Expansion of 2,407 Acres and Minimum Estuarine Restoration** – This alternative would provide for moderate expansion of the Refuge boundary (2,407-acre addition). It places new management emphasis on the restoration of estuarine habitat and improved freshwater wetland management. The current environmental education program

would be improved and expanded, to the largest degree of all action alternatives. There would be fewer changes to the trail system than in other action alternatives, and the Refuge would remain closed to waterfowl hunting, with the closure posted and enforced.

- **Alternative C—Refuge Expansion of 2,407 Acres and Moderate Estuarine Restoration** – This alternative would provide for the same expansion of the Refuge boundary as in Alternative B (2,407-acre addition). However, it places a stronger emphasis on the restoration of estuarine habitat, while improving freshwater wetland and riparian habitats. The environmental education program would be improved and expanded, although serving fewer students than described in Alternative B. Moderate changes would occur to the trail system. The largest portion of Refuge acreage would be opened to waterfowl hunting of any alternative, consolidated with State lands, and limited to 3 days per week, if an agreement can be reached with the WDFW.

- **Alternative D—Preferred Alternative: Refuge Expansion of 3,479 Acres and Maximum Estuarine Restoration** – This alternative would provide for the largest amount of Refuge boundary expansion (3,479-acre addition). It also maximizes estuarine restoration, while improving freshwater wetland and riparian habitats on the Refuge. The environmental education program would be improved and expanded, although not to the highest expansion described in Alternative B. The greatest changes would occur to the trail system of any alternative. A smaller portion of Refuge lands would be opened to hunting, 7 days per week, with no changes to hunting on WDFW lands.

These four alternatives are described in more detail below, starting with a summary of similarities among the alternatives, followed by a detailed description of each alternative.

2.2 Similarities Among Alternatives

Although the alternatives differ in many ways, there are similarities (i.e., shared features or management components) among them as well. Following is a description of: (1) the features common to all alternatives; and (2) features common to all action alternatives.

2.2.1 Features Common to All Alternatives (A-D)

All alternatives contain some common features. These are listed below to reduce the length and redundancy of the individual alternative descriptions.

- *Complete Land Acquisitions within Current Approved Refuge Boundary* - Interests would continue to be acquired in the remaining 1,011 acres within the existing approved Refuge boundary, either through fee acquisition or other land protection measures.

- *Extensive Repairs to Brown Farm Dike (Exterior Dikes)* - The Brown Farm Dike (exterior dikes) have severely deteriorated and would require extensive repairs to prevent dike failure and continued seepage. The Brown Farm Dike was additionally damaged by the magnitude

6.8 Nisqually Earthquake on February 28, 2001. The epicenter was located in the Nisqually delta. It resulted in thousands of feet of linear cracks in the dike, with the largest amount of damage along McAllister Creek and secondarily along the Nisqually River. Repairs are needed, and geologists and engineers have indicated that the dikes do not meet accepted safety or structural standards. Any portions of the Brown Farm Dike that would remain in Alternatives A-D would require extensive repairs.

- *Resource Monitoring* - Existing and new fish, wildlife, and vegetation monitoring programs would be conducted by Refuge staff, volunteers, or cooperators to support adaptive management. Monitoring programs would include monitoring and evaluation of habitat management and restoration activities, sensitive species, and public uses.

- *Management of Non-native, Invasive Species* – Several non-native, invasive species threaten the habitat quality and biodiversity of the Refuge. Efforts to survey for, control, and monitor invasives would continue with the development and implementation of an Integrated Pest Management Plan, invasive species data collection and mapping, and implementation of a volunteer program to assist in control efforts.

- *Restoration of West Bluff Parcel* - Restoration of the West Bluff parcel of the Refuge (formerly the Meek property) would continue under all alternatives. The long-term goals of restoring this deforested parcel is to create a native conifer forest with Douglas-fir as the primary species to provide a continuous forested corridor, improve watershed protection, and create an effective buffer for nesting bald eagles and other migratory birds.

- *Improved Protection of West Side of McAllister Creek* - Wildlife disturbance caused by illegal foot access on the west side of McAllister Creek would be reduced by signing the west shoreline from Luhr Beach south along McAllister Creek. A new visitor contact station with interpretive information at Luhr Beach and increased visitor contact to educate visitors about these restrictions would also reduce trespass in this area. These efforts would benefit nesting great blue herons and bald eagles, as well as other migratory birds.

- *Management of Minor Non-Wildlife Dependent Recreational Uses (such as Apple, Berry, and Mushroom Picking)* - Certain non-wildlife dependent recreational activities occur occasionally on the Refuge. Apple and blackberry collection for off-site consumption would no longer be allowed. Picking would be restricted to trails only and for consumption only while on the Refuge. Other plant material and mushroom picking would continue to be prohibited to protect sensitive wildlife habitat and maintain established wildlife sanctuary areas closed to public entry.

- *Visitor Center, Boardwalk, and Public Parking* - The Visitor Center, 1-mile accessible boardwalk loop trail, and 100-space public parking lot would remain unchanged under all alternatives. The Visitor Center offers excellent education and interpretive opportunities for the public. The boardwalk trail with interpretive panels allows visitors to observe and learn about wildlife in a diversity of habitats.

- *Protection and Management of Cultural Resources* - Under all alternatives, the Service would continue to manage cultural resources in accordance with public law and agency policy. The Service is required to consider the effects of its actions on archeological and historic properties. Small projects require a "Request for Cultural Resource Compliance" form to be completed in conformance with the Programmatic Agreement among the Service, the Advisory Council on Historic Preservation (ACHP), and the State of Washington Historic Preservation Officer (SHPO). Additional consultation, surveys, and clearance would be required when large projects are sponsored by the Service.

- *Management of Tribal Lands East of the Nisqually River as Part of Nisqually NWR* - The Nisqually Indian Tribe recently purchased the Braget farm east of the Nisqually River, including two lowland parcels that fall within the approved Refuge boundary. Congress passed Public Law 106-291, which authorized $850,000 to be granted to the Nisqually Indian Tribe for part of the purchase, and stated that the lowlands be managed as part of the Refuge through a 25-year Cooperative Agreement/renewable lease, and that the lands be managed for Refuge purposes in perpetuity. These lowland parcels would be managed by the Service as part of Nisqually NWR, under a Cooperative Agreement with the Nisqually Indian Tribe. Life tenant uses on these tribal lands retained by Kenneth Braget (the previous landowner) include agriculture and a private hunt club.

- *Estuarine Restoration on Tribal Lands East of the Nisqually River* - The Nisqually Indian Tribe, in cooperation with the Service, is in the process of designing and implementing an estuarine restoration program on approximately 300 acres of lowland portions of the tribe's property east of the Nisqually River. Although this would occur on land within the approved Refuge boundary, the specific restoration project would proceed independent of the Nisqually NWR CCP and associated EIS. Compliance requirements for the tribe's restoration plan would be addressed through the permit process.

  The restoration of salt marsh and other estuarine habitats is envisioned by removing dikes and reconnecting diked fields to Red Salmon Slough, a tidal channel between the Nisqually River and the East Bluff. A phased approach to restoration has been developed (Wiltermood Associates, Inc. 2000) and the tribe initiated restoration in 2002, beginning in areas to the north and working south.

- *Treaty Rights* - Tribal fishing, hunting, and gathering rights as reserved in Article 3 of the Treaty of Medicine Creek of 1854 (10 Stat. 1132) are common to all alternatives.

- *Public Access Restricted to Trails Only* - Foot access by the public would continue to be restricted to trails only. Exceptions would include special study areas identified for environmental education groups and research activities permitted under special use permit.

- *Primitive Trail in Surge Plain* - A half-mile primitive trail would be established in the forested surge plain habitat, a tidally influenced riparian forest along the Nisqually River. It would connect to the existing boardwalk spur in the surge plain to provide a longer experience in this unique habitat. It would be minimally maintained and would not be fully accessible. Portions may be flooded by higher tides and storm events.

- *Replacement of Twin Barns Environmental Education Center* - The Twin Barns Environmental Education Center was severely damaged by the February 2001 Nisqually Earthquake, and it was permanently closed to the public for safety reasons. The Environmental Education Center has been temporarily moved to a trailer near the maintenance compound. A new facility is required to upgrade facilities and ensure a safe, quality experience for school children participating in the program.

- *Shellfishing Allowed According to County and State Regulations* - Recreational shellfishing would continue to be allowed in tidal habitats according to County and State regulations. However, the Luhr Beach area has been closed since summer 2000 because of high levels of fecal coliform contamination. Commercial geoduck harvest would continue under State regulation in waters in or adjacent to the Refuge.

- *Hazardous Waste Sites* – Service policy requires an environmental site assessment to be conducted prior to the acquisition of real property. Where hazardous substances are found, the acquisition may proceed only if: (1) it will result in no increased cost to the Department of the Interior (such as for cleanup remediation); (2) the proposal including any associated liability risk is determined to benefit the Service; or (3) the acquisition is mandated by Congress, courts, or the Secretary of Interior (USFWS 1996). The Service typically requires hazardous substances to be cleaned up as a condition of property acquisition.

- *Hazardous Spill Response* – The Service is a cooperating agency in the Northwest Area Contingency Plan for Washington, Oregon, and Idaho, which is dedicated to ensuring coordinated, efficient, and effective support of Federal, State, Tribal, local, and international responses to significant oil and hazardous substance incidents within the Pacific Northwest Region (Regional Response Team, Northwest Area Committee). The Service is also a cooperating agency in the Washington Marine Geographic Response Plan, which includes response for contaminant spills that could affect open waterways and near shore areas of Puget Sound, including the Nisqually River and Delta and McAllister Creek (WDOE 1997).

2.2.2 Features Common to All Action Alternatives (B-D)

These features are common to Alternatives B, C, and D but would not be implemented as part of the No Action Alternative.

- *Habitat Restoration in Expansion Area* – As acreage south of I-5 is acquired, the lands would be assessed and restored to improve wildlife and fish habitat quality. For example, those lands appropriate for seasonal freshwater wetland restoration would be enhanced to provide waterfowl and marshbird habitat, with some open grasslands enhanced for grassland-dependent species. Lands adjacent to McAllister Creek would be restored to riparian habitat with site-appropriate native plants, and some areas would be re-vegetated as corridors to provide cover and forage for those wildlife species needing a transition zone. Freshwater wetland restoration would be designed and managed in a way to avoid any flooding effects on adjacent lands.

- *Protection of Estuarine Restoration Areas for Research and Monitoring* - Public access would be restricted in restored estuarine areas within the Brown Farm Dike. Restored areas would be closed to public access to provide wildlife sanctuary and a research study area to document processes of estuarine restoration and fish and wildlife responses with minimal human disturbance. This closure would also maximize wildlife viewing opportunities for those restricted to trails. New boardwalk trails would be allowed in limited areas at the edges of restored areas to provide new wildlife viewing opportunities in estuarine habitats.

- *Improved Fishing Opportunities* - Improved quality bank fishing would be provided on the east bank of the Nisqually River (Trotter's Woods area) south of I-5, if areas are successfully acquired or through a cooperative management agreement with Fort Lewis (U.S. Army), the current landowner. Cooperative efforts with Fort Lewis could also involve key partners, including the Nisqually Indian Tribe.

- *New Walk-in Hunting Opportunities* - Walk-in waterfowl hunting with set blinds would be considered if sufficient lands are acquired south of I-5, which would provide adequate wildlife sanctuary and minimal conflict with other priority public uses.

- *Research Natural Area (RNA) Closures Enforced* - The RNA in the northeastern part of the Refuge would be retained, and requirements to keep this designated area closed to consumptive uses would be enforced. However, Alternatives C and D propose to modify the current RNA boundary (reducing the area by approximately 166 and 29 acres, respectively) to provide a high quality hunting area at the mouth of the river and create a clearly delineated proposed hunting area that can be posted. The RNA would be posted and fishing, shellfishing, and waterfowl hunting would be prohibited.

- *Speed Restrictions and Seasonal Closures for Boats* - A speed limit of 5 mph would be established for watercraft in all Refuge waters. This would broaden the current 5 mph speed restriction for all watercraft within 200 feet of any shoreline by Thurston County regulation. The RNA would be closed to all boating from October 1 to March 31 to provide a seasonal sanctuary for migratory birds and other wildlife.

- *Future Boating Restrictions* - Boating activity and its potential effects on wildlife would continue to be monitored to ensure that boating remains compatible with Refuge purposes and that new boating restrictions provide sufficient wildlife protection. Future closures or additional restrictions would be considered if undue wildlife disturbance occurs.

- *Management of Luhr Beach Area and Nisqually Reach Nature Center* - The Refuge would develop a cooperative management agreement with the WDFW to cooperatively manage the Luhr Beach boat ramp area, including the Nisqually Reach Nature Center. Boating, waterfowl hunting, fishing, and Refuge regulations and general Refuge and wildlife information would be provided at a new Visitor Contact Station. The Refuge would also work cooperatively with the Nisqually Reach Nature Center to conduct a cooperative education program to provide an even stronger environmental and public education program on the marine resources of the Nisqually delta.

2.3 Detailed Description of the Alternatives

2.3.1 Alternative A—No Action (Status Quo)

This alternative assumes no change from past management programs and is considered the base from which to compare the other alternatives (Figure 2.3-1).

The Refuge would continue to complete land acquisition within the approved Refuge boundary (3,936 acres), but no expansion would occur.

The area within the Brown Farm Dike, approximately 1,000 acres, would be retained and managed as freshwater wetlands and grasslands. Some limited improvements would be made to the current habitat management program to improve habitat quality. Attempts to enhance freshwater habitats would be investigated but can include installing pumps for existing artesian wells or drilling new wells to increase the source of freshwater. Water control structures, including culverts and risers, would be replaced or installed to make minor improvements in the ability to control water levels and reduce the effects of beaver activity. The extent of ponds and seasonal marshes would be increased by sculpting and excavating larger wetlands. Limited reed canary grass control would be conducted where conditions allow, including a combination of mowing, discing, and herbicide application. The current haying and mowing program would continue (see Section 3.5.1). No new internal dikes or management units would be created, but external dikes (28,000 linear feet) would need extensive repairs and continued maintenance. Some native riparian plantings would occur north of the headquarters building and along slough systems within the diked area to mimic native riparian habitat historically found in the delta. Since these areas are not directly connected to a system with natural hydrology, they would not function as native riparian systems.

The Service would continue to provide a limited environmental education program, serving up to 5,000 students each year. The program includes a reservation system, trails, and field trip assistance by Refuge volunteers.

To provide opportunities for wildlife observation, interpretation, and wildlife photography, the Service would continue to provide 7 miles of trails (primarily using the existing dike system), including the accessible 1-mile loop boardwalk trail with interpretive panels. As described in Section 2.2.1, an unimproved, primitive ½-mile trail would be developed in the Nisqually River surge plain forest, connected to the existing boardwalk spur. This trail would be minimally maintained and would not be fully accessible. Public facilities would continue to be provided, including the Visitor Center, with interpretive displays focusing on existing habitats and wildlife.

Nisqually NWR would continue to be closed to waterfowl hunting. The current waterfowl hunting on Refuge lands is unauthorized since the Refuge has not been officially opened to hunting. Unsigned areas would continue to be administratively uncontrollable, and closures in these areas would not be enforced. Waterfowl hunting would continue to provide insufficient wildlife sanctuary, occurring on large portions of Refuge tideflats, in McAllister Creek, and in portions of the RNA. The area within the Brown Farm Dike would continue to be closed to waterfowl hunting. The 5½-mile loop trail would continue to be closed seasonally during the waterfowl

hunting season to ensure visitor safety and provide wildlife sanctuary. No new wildlife sanctuary areas would be established. WDFW would continue to have jurisdiction and management responsibility over WDFW lands.

Fishing would continue to be allowed by boat, following State regulations. Bank fishing at the McAllister Creek fishing area, which is accessible by foot or boat, would continue to be allowed. A portion would still be seasonally closed during the waterfowl hunting season. RNA closures to consumptive uses would not be enforced. The area within the Brown Farm Dike would continue to be closed to fishing. No new fishing opportunities would be developed.

As described in Section 2.2.1, Features Common to all Alternatives, recreational shellfishing would continue to be allowed according to County and State regulations. Commercial geoduck harvest would continue under State regulations in waters in or adjacent to the Refuge.

As described in Section 2.2.1, Features Common to all Alternatives, boat access would continue to be allowed in the tideflats and river/creek systems. PWC use would continue to be allowed. Thurston County regulations would apply, requiring a speed limit for all watercraft of 5 mph within 200 feet of any shoreline, but this regulation would continue to be minimally enforced.

2.3.2 Alternative B—Refuge Expansion of 2,407 Acres and Minimum Estuarine Restoration

As shown in Figure 2.3-2, Alternative B would expand the Refuge boundary by 2,407 acres, for a total authorized Refuge boundary encompassing 6,343 acres. The proposed addition would include 512 acres of upland habitat and 1,891 acres of floodplain, riparian, and wetland habitat. Expansion would provide improved habitat protection along portions of the East Bluff north of I-5, including a 200-foot wide forested corridor along the crest of the bluff. New areas south of I-5 would include floodplain, riparian, forested, and freshwater habitats, consisting of portions of the Nisqually Valley floodplain areas, creeks and sloughs, and portions of the forested bluffs along McAllister Creek. This alternative is distinguished from expansion in Alternative D (the Preferred Alternative) by protecting only a small part of the Nisqually River corridor (325 acres), including the Trotter's Woods area just south of I-5, and 386 acres less of floodplain and forested habitat in the Nisqually Valley. A variety of techniques would be used to improve habitat protection including cooperative management agreements, leases, easements, fee title acquisition, and strengthening cooperative efforts with partners. Cooperative efforts with Fort Lewis could also involve key partners, including the Nisqually Indian Tribe. Efforts would continue to complete acquisition or protection within the existing Refuge boundary, including the development of a cooperative management agreement with the State to allow consolidated management of the Luhr Beach area.

Habitat management and restoration in the diked interior would include a combination of 30% muted estuarine habitat (restored area created by maintaining dikes with selected breach locations for tidal water influence), 15% full estuarine restoration (restored area created by breaching dikes in slough channel locations and shaving remaining dikes down to grade), and improved freshwater

Figure 2.3-1 Alternative A: No Action (Status Quo)

8 ½ x 11 color

Back of Figure 2.3-1
Alternative A: No Action (Status Quo)

Figure 2.3-2 Alternative B: Moderate Refuge Expansion and Minimum Estuarine Restoration

11 x 17 color

Back of Figure 2.3-2 Alternative B: Moderate Refuge Expansion and Minimum Estuarine Restoration

wetland management in the remaining diked area. Essentially, this alternative would restore some estuarine habitat but would retain dikes to minimize the effect of estuarine restoration on existing trails.

Approximately 318 acres (30%) of the diked interior would be restored to muted estuarine habitat by creating bridged breaches and retaining dikes. Muted estuarine habitat would be created by breaching the dike in five locations to reconnect several historical slough systems with the waters of Puget Sound. Breaches would be large to maximize tidal volume and flow, varying in width from 150 to 350 feet depending on the size of the slough being restored. Tides would fully penetrate the diked unit, but the tide cycle would be slightly delayed, and some ponding would occur inside the diked tidal area due to the restrictions caused by limited breaches and the barrier caused by dikes. This would produce a muted, or less than fully functional, estuarine system (ENSR 1999). Material removed from the dike breaches would be used for interior dike construction. Heavy armoring, including steel reinforced wing walls and riprap, would be installed to stabilize breaches and keep them from eroding or becoming enlarged. Bridges would be built to span the breaches, capable of supporting heavy equipment to allow regular dike maintenance and repair. A borrow ditch (created when material was "borrowed" to build the dikes) parallels the dike. The borrow ditch would not be filled in the muted tidal impoundment because the costs to import sufficient material are prohibitive. Consequently, the borrow ditch would also pond and channel tidal waters in the area restored to muted tidal circulation.

To prevent failure and continued seepage, exterior dikes would require extensive repairs due to their severely deteriorated condition and damage sustained during the February 2001 Nisqually Earthquake. New dike armoring, including riprap, would be needed to protect dikes from erosion caused by tidal waters and wave action inside and outside the restored area. This alternative would require the construction of 9,700 linear feet of new exterior dike between the restored estuarine areas (muted and full) and the diked freshwater habitat and 13,200 linear feet of a new interior dike system. New internal and external dikes would be planted with vegetation to stabilize banks, prevent erosion, and provide screening and habitat. Dikes would continue to be maintained with periodic resurfacing (graveling), mowing, brushing, and other techniques. A total of 33,800 linear feet of exterior dike would need to be maintained.

Approximately 140 acres (15%) of diked habitat would be restored to fully functional estuarine habitat in the northern half of the Shannon Slough system along McAllister Creek, by removing 0.75 mile of dike to grade and filling the adjacent borrow ditch. Removal of some of the artificial bench of sediments that have built up along the outside of the dike may be needed to allow full tidal circulation in the restored area.

Management of 542 acres of freshwater and grassland habitats would be improved in the remaining diked area by creating a higher proportion of freshwater habitat through conversion of some grasslands to seasonal freshwater wetlands and ponds. The freshwater area would be subdivided into five management units by new internal dikes to allow much more intensive management, thereby improving habitat quality and controlling reed canary grass. However, due to the large size of management units and freshwater supply limitations, the effectiveness of management actions may be limited, including the ability to flood large areas to depths sufficient

for invasive vegetation control. A new exterior dike on the north side of the management units would be placed along the highest contour line to separate the muted estuarine restoration area from the management habitat. A large amount of material would be required for the new dike due to this area's relatively low elevation. The material, at least in part, would be borrowed from units where pastureland would be converted to freshwater ponds. This would increase the overall length of exterior dike by approximately 1.25 miles.

Small permanent ponds would be created and seasonal wetlands enlarged by excavating and sculpting higher areas. Permanent ponds would need to be relatively small because of the limited water sources currently on the Refuge and to allow more efficient water movement. New water control structures and pumps would be installed between units to allow water movement and to provide the ability to drain and flood individual units. Units and ponds would be designed to allow flooding in selected areas at least 3 feet deep for up to 3 to 4 months to improve reed canary grass control.

A more intensive management regime would be implemented to keep freshwater wetlands and grasslands in high quality condition. Management techniques would include a rotating cycle of draining, mowing, discing, scraping, herbicide application, and flooding to control reed canary grass, prevent brush invasion, and halt succession in these habitats. Management of any remaining grassland areas would include regular mowing. Fertilization and seeding in grasslands would also be conducted to enhance the quality for fall and winter waterfowl browse. The water delivery system would be periodically maintained, including the excavation or cleaning of sloughs, ditches, and water control structures.

As in Alternative A, some riparian plantings would occur north of the headquarters building and along slough systems in the southern portion of the remaining diked area to widen the corridor of riparian habitat, mimicking native riparian habitat historically found in the delta.

The environmental education program would be improved to provide for the largest expansion of the program, serving up to 20,000 students each year. The program would include development of site-specific materials and curricula, provide teacher training and field trip support, develop and strengthen partnerships in the area, and serve as a model for other programs. This alternative would require the highest level of applicable staff to support this program. As described in Section 2.2.2, for all action alternatives, the Luhr Beach area (Nature Center and boat landing) would be managed under cooperative management agreement, and use of the Nisqually Reach Nature Center would be coordinated with the Refuge environmental education program.

Of the action alternatives, Alternative B provides the smallest change in trail configuration. The existing 5½-mile dike loop trail would be roughly the same length, although in a revised configuration around the Shannon Slough system. A large portion of the trail would continue to be closed during the waterfowl hunting season to ensure visitor safety and provide improved waterfowl sanctuary. Interpretation would focus on existing habitats, estuarine restoration, improved management, and wildlife.

A waterfowl hunting program would not be implemented on the Refuge, and the Refuge boundary would be clearly signed to delineate Refuge lands from WDFW property where hunting is allowed. Regulations would be enforced, eliminating the unauthorized hunting that has previously occurred in unsigned portions of the Refuge. WDFW would continue to have jurisdiction and management responsibility over WDFW lands.

The McAllister Creek bank fishing area, accessible by foot or boat, would continue to be provided. A portion of the bank fishing area would continue to be closed during the waterfowl hunting season to ensure visitor safety. The Trotter's Woods area south of I-5, if acquired or under a cooperative management agreement, would be managed to provide a high quality bank fishing area along the Nisqually River while providing improved habitat protection. The boat ramp in the Trotter's Woods area would remain available for use by the Nisqually Indian Tribe. An accessible fishing site at Luhr Beach would be provided, if feasible, following development of a cooperative management agreement with WDFW.

Boating and shellfishing are described above in Section 2.2.1, Features Common to All Alternatives (A-D), and Section 2.2.2, Features Common to all Action Alternatives.

2.3.3 Alternative C—Refuge Expansion of 2,407 Acres and Moderate Estuarine Restoration

As shown in Figure 2.3-3, expansion of the Refuge boundary under Alternative C would be the same as described under Alternative B (i.e., 2,407 acres, including 512 acres of upland habitat and 1,891 acres of floodplain, riparian, and wetland habitat).

This alternative would restore approximately 515 acres (50%) of the diked interior to estuarine habitat. Dikes would be breached at major sloughs, remaining dikes would be lowered to grade, and the material from dike removal would be used to fill in the borrow ditch to allow unimpeded tidal circulation in the restoration area. Some of the artificial bench of sediments that have accumulated along the outside edge of the dike may be removed to allow full tidal circulation. Small sections of the exterior dike would be left in place to reduce the loss of the largest deciduous trees along the Nisqually River. A new cross dike, approximately 1 mile long, would be built to enclose the remaining freshwater habitat. Dike armoring would be required on this new feature to protect exterior banks from erosion from tidal waters and wave action. New dike material would be borrowed from freshwater wetland enhancement sites, dikes to be removed, and adjacent areas. This alternative would retain the Shannon Slough system along McAllister Creek as diked freshwater habitat. All remaining exterior dikes would require extensive repairs to prevent seepage and failure. Dikes would continue to be maintained with periodic resurfacing (graveling), mowing, brushing, and other techniques.

This alternative would allow a new portion of the Nisqually River to flow unrestricted, including during storm and flood events. Riparian habitat would be enhanced along the Nisqually River by replanting a 38-acre area north of the Twin Barns to restore forested, surge plain habitat. It would be protected by constructing a berm to the northwest but would still receive saltwater

influence periodically. The berm would be designed to prevent fish entrapment through the design of berm height and grading.

Management of the remaining 447 acres of freshwater and grassland habitats would be improved, with a higher proportion of freshwater habitat created by converting some grasslands to seasonal freshwater wetlands and ponds. However, due to the large size of management units and freshwater supply limitations, the effectiveness of management actions may be limited, including the ability to flood large areas to depths sufficient for vegetation control. The freshwater area would be subdivided into five units by new internal dikes to allow more intensive management to improve habitat quality and control reed canary grass. This alternative would require the construction of 4,600 linear feet of new exterior dike between the restored estuarine area and the diked habitat (along the northern boundary) and 13,000 linear feet of a new interior dike system. New internal and external dikes would be planted with vegetation to stabilize banks, prevent erosion, and provide screening and habitat. Dikes would continue to be maintained with periodic resurfacing (graveling), mowing, brushing, and other techniques. A total of 15,600 linear feet of exterior dike would need to be maintained. A much more intensive freshwater wetland, grassland, and riparian habitat management regime would be implemented in the remaining diked habitat, similar to that described in Alternative B except within a smaller area. Some riparian plantings would occur north of the headquarters building and along slough systems within the diked area to mimic native riparian habitat historically found in the delta.

This alternative would provide an improved and expanded environmental education programs similar to Alternative B, except that it would serve up to 15,000 students instead of 20,000 each year. Refuge staff would have to be diverted to operate a waterfowl hunt program in this alternative, reducing the effort available for the education program. Improvements would include development of site-specific materials and curricula; providing teacher training, field trip support, and enhanced facilities; developing and strengthening partnerships with others to coordinate programs in the area; and serving as a model for other programs. Increased staff support would be required to perform at this improved/expanded level. As in Alternative B, the Luhr Beach area (Nature Center and boat landing) would be managed under a cooperative management agreement, and use of the Nisqually Reach Nature Center would be coordinated with the Refuge environmental education program.

As part of this alternative, the existing 5½-mile dike trail would be reduced to a 3¾-mile round trip, including a loop with a boardwalk extension. No seasonal trail closure would be required because waterfowl hunting would no longer occur along McAllister Creek. An approximately 2½-mile loop trail would be developed on tribal and Refuge property east of the Nisqually River, with temporary seasonal closures instituted during the waterfowl hunting season to avoid conflict with the private hunt club. This closure would no longer be necessary when the hunt club ceases operation. This trail would provide new wildlife viewing opportunities and would also require construction of a new parking area and visitor contact station. A bridge would be needed across Red Salmon Creek to support a loop configuration. The specific design of this trail would be developed during implementation of the CCP. Interpretation would focus on existing habitats, estuarine restoration, improved management, and wildlife. If lands are acquired, other new trail options would include trails on the East Bluff to link with planned Pierce County trails.

Figure 2.3-3 Alternative C: Moderate Refuge Expansion and Estuarine Restoration with Limited Housing

11 x 17 color

Back of Figure 2.3-3 Alternative C: Moderate Refuge Expansion and Estuarine Restoration with Limited Housing

A consolidated waterfowl hunting area consisting of both Refuge and WDFW lands (1,170 acres total) would be managed by the Service. More of the Refuge (713 acres) would be open to waterfowl hunting than in Alternative D. The hunting area would include Refuge tideflats west of the Nisqually River and north of the current Brown Farm Dike and WDFW lands north and northeast of the Brown Farm Dike. The WDFW tract in McAllister Creek would be closed to hunting. The RNA boundary would be modified to provide a high quality hunting area at the mouth of the river and create a clear delineation (straight boundary line) of the hunting area, reducing it by 166 acres to 627 acres. The area within the Brown Farm Dike, including the estuarine restoration area, would remain closed to hunting. The Service would be responsible for waterfowl hunting management on the newly consolidated hunting area through a cooperative management agreement with WDFW. Luhr Beach facilities would also be managed by the Service through a cooperative management agreement. Restrictions to ensure a high quality hunting experience would include instituting a 3 day/week, 25-shell limit. There would be no limits placed on numbers of hunters and no designated blind sites. WDFW concurrence would be required. If an agreement could not be reached by December 2004, the Refuge would follow Alternative B and officially close to hunting, be posted and enforced, thereby eliminating the unauthorized hunting on the Refuge.

The McAllister Creek bank fishing area, accessible by foot or boat, would continue to be provided. No seasonal closure would be required during the waterfowl hunting season. Two new fishing areas along the Nisqually River would also be provided, including the Trotter's Woods area (as described in Alternative B) south of I-5, and an area off a new loop trail east of the Nisqually River north of I-5 on tribal and Refuge properties. Fishing access on tribal and Refuge property east of the Nisqually River would be associated with the development of the trail, parking area, and visitor contact station, as described above. Accessible fishing access at Luhr Beach would be provided, if feasible, following development of a cooperative management agreement. The RNA would be closed to fishing, with the closure enforced. The area within the Brown Farm Dike and any tidal restoration area would be closed to fishing.

Boating and shellfishing are described above in Section 2.2.1, Features Common to All Alternatives (A-D), and Section 2.2.2, Features Common to All Action Alternatives.

2.3.4 Alternative D—Preferred Alternative: Refuge Expansion of 3,479 Acres and Maximum Estuarine Restoration

As shown in Figure 2.3-4, Alternative D would provide for the largest expansion of the Refuge boundary, adding an additional 3,479 acres for a total authorized boundary of 7,415 acres. The proposed expansion would include 512 acres of upland habitat and 2,963 acres of floodplain, riparian, and wetland habitat. The boundary would increase habitat protection on the East Bluff north of I-5 to include a forested corridor, as described in Alternatives B and C. It would also extend the boundary south of I-5 to include floodplain, bluff, wetland, and upland forested habitats along the Nisqually River and McAllister Creek. The main difference between the expansion in this alternative and Alternatives B and C is the enlarged protection it would provide to the Nisqually River corridor and the Nisqually Valley, by improving protection of the riparian forested river corridor, including a portion of the proposed RNA on Fort Lewis property, as well

as greater protection in the floodplain and forested habitat in the Nisqually Valley. This alternative would provide the greatest protection of bluffs, floodplain wetlands, and the river corridor south of I-5.

This alternative maximizes estuarine restoration while still providing freshwater wetland and riparian habitat on the Refuge. Under Alternative D, 699 acres (70%) of the diked area would be restored to estuarine habitat. This alternative component is based on the results of a scientific workshop hosted by the Service in June 1998. The restored area would reconnect a majority of the historic slough systems in the Nisqually delta to Puget Sound, creating a more complete and functional estuarine system than any other alternative. This would require breaching the existing Brown Farm Dike in specific locations and removing much of the dike down to grade. Material from the dike would be used to fill in the associated borrow ditch. Some of the artificial bench of sediments that have accumulated along the outside edge of the dike may be removed to allow full tidal circulation. Small sections of the exterior dike would be left in place to reduce the loss of the largest deciduous trees along the Nisqually River. A new exterior dike would be built to protect the remaining freshwater habitat. Alternative D would require the construction of 12,000 linear feet of new exterior dike and 10,500 linear feet of a new interior dike system. New internal and external dikes would be planted with vegetation to stabilize banks, prevent erosion, and provide screening and habitat. Dikes would continue to be maintained with periodic resurfacing (graveling), mowing, brushing, and other techniques. A total of 15,000 linear feet of exterior dike would need to be maintained.

The remaining 263-acre area within the dike would be managed primarily as freshwater wetlands and riparian habitat. As described in Alternatives B and C, a much more intensive freshwater wetland, grassland, and riparian habitat management regime would be implemented in the remaining diked habitat, except within a smaller area. Internal dikes would be built to create five management units. Grassland habitat would be managed as a smaller component of a mosaic of freshwater wetland habitats, scattered in patches and along the edges of freshwater wetlands. As in Alternatives B and C, some riparian plantings would occur north of the headquarters building and along slough systems within the diked area to mimic native riparian habitat historically found in the delta.

As described under Alternative C, 38 acres of riparian/surge plain habitat would also be created to increase the acreage of this important habitat along the Nisqually River.

The environmental education program under the Preferred Alternative would be the same as Alternative C, serving up to 15,000 students annually.

This alternative would have the largest effect on the existing trail system. The existing 5½-mile loop trail would be reduced to provide an approximately 3½-mile round trip trail by combining the Twin Barns Boardwalk Loop Trail (1 mile), existing and new exterior dike, and a new boardwalk trail extension into the estuary. The trail would no longer be configured in a loop. The boardwalk extension would help offset changes in the trail and improve wildlife viewing opportunities in estuarine habitat. The boardwalk extension along McAllister Creek would be seasonally closed to prevent conflicts with waterfowl hunters on WDFW property. As in all

Figure 2.3-4 Alternative D: Maximum Estuarine Restoration with Consolidated Hunt Program Managed by Refuge

11 x 17 color

Back of Figure 2.3-4 Alternative D: Maximum Estuarine Restoration with Consolidated Hunt Program Managed by Refuge

alternatives, a primitive ½-mile loop trail would be provided in the surge plain habitat. Similar to Alternative C, an approximately 2½-mile loop trail would be developed on tribal and Refuge property east of the Nisqually River, with temporary seasonal closures during the waterfowl hunting season until the private hunt club is discontinued on tribal lands. This trail would provide new wildlife viewing opportunities. A bridge would be needed across Red Salmon Creek to support a loop configuration. The specific design of this trail would be developed during implementation of the CCP. Interpretation would focus on existing habitats, estuarine restoration, improved management, and wildlife. Other new trail options would include trails on the East Bluff as part of a larger Pierce County trail system.

Under the Preferred Alternative, the Service would open 191 acres of Refuge lands to a 7 day/week hunting program during the waterfowl hunting season. These lands are located adjacent to the WDFW parcel north of the Brown Farm Dike. The RNA would be reduced by 73 acres and the RNA boundary moved to the east to provide a high quality hunting area at the mouth of the river. An additional 44 acres would be added to the RNA at the south end, resulting in a total reduction of 29 acres in the RNA to 764 acres. By opening 191 acres of the Refuge to waterfowl hunting, the hunting area north of the Brown Farm Dike would be configured in a single rectangular block, reducing confusing boundary issues. Areas designated as "No Hunting Areas" would be posted and enforced, eliminating the unauthorized hunting that has occurred previously on the Refuge.

Waterfowl hunting would continue on all WDFW lands. A 25-shell limit would be instituted on Refuge and WDFW lands. WDFW would maintain jurisdiction and management responsibility over WDFW lands, and the Service would manage the hunting program on Refuge lands. Refuge outreach, education, and enforcement programs would benefit hunting programs on State lands as well. The area within the Brown Farm Dike, including the estuarine restoration area, would be closed to hunting.

The bank fishing area along McAllister Creek would no longer be available due to dike removal. However, the closure of the McAllister Creek Hatchery (July 2002) is expected to reduce fishing opportunity dramatically, lessening the effect of this change. Bank fishing access along McAllister Creek south of I-5 would be provided in the future if acquisition or land protection occurs in appropriate locations. Fishing alternatives on the Nisqually River and at Luhr Beach would be the same as described in Alternative C. An additional accessible fishing access only area at the Nisqually River Overlook off the Twin Barns Loop Boardwalk Trail would also be investigated to determine if a stable fishing platform can be maintained along that portion of the river. The RNA would be closed to fishing with closures enforced. The area within the Brown Farm Dike and any tidal restoration area would be closed to fishing.

Boating and shellfishing are described above in Section 2.2.1, Features Common to All Alternatives (A-D), and Section 2.2.2, Features Common to All Action Alternatives.

2.3.5 Comparison of the Alternatives by Issue

Table 2.3-1 (at the end of this chapter) presents an issue-by-issue comparison of the four alternatives selected for detailed analysis.

2.4 Alternative Components Considered but Eliminated from Detailed Study

The alternatives development process under NEPA and the Improvement Act is designed to allow consideration of the widest possible range of issues and potential management approaches. During the alternatives development process, many different solutions were considered. The following alternative components were considered but not selected for detailed study in this CCP/EIS for the reason(s) described.

- *Larger Refuge Expansion Along the Nisqually River* - A larger boundary expansion was considered along the Nisqually River south of I-5, which would have increased expansion to 5,133 acres (1,654 acres more than Alternative D). This larger expansion was based on a proposed RNA on Fort Lewis lands and the 100-year flood line. It was not selected because it overlapped with the Nisqually Indian Tribe's established reservation boundary. If lands within that recognized boundary were to become available, the tribe would pursue interests in them.

- *Estuarine Restoration to I-5 Boundary* - Maximum estuarine restoration would have encompassed the entire 1,000 acres of diked habitat. This alternative was not selected because it would severely restrict opportunities for wildlife-dependent public uses such as wildlife observation, interpretation, and environmental education, which are considered priority public uses on National Wildlife Refuges. In addition, it would not provide a diversity of freshwater habitat types to support the variety of wildlife populations that currently occur on the Refuge.

- *Intensive Freshwater Management Within Diked Area With No Estuarine Restoration* - Under this component, no estuarine restoration would be undertaken. The diked area would be retained, and the habitat would be managed much more intensively to improve the quality of freshwater and grassland habitats. Because of the difficulty in maintaining non-native grassland areas that have become progressively wetter each year, reed canary grass has spread rapidly and dominates more than 30% of the diked area. In addition, there has been an increase in scrub-shrub habitat because equipment access is limited in these wet areas. The Brown Farm Dike would need extensive repairs and replacement. An extensive internal dike system would have to be built to provide the water management capabilities needed for effective reed canary grass control and freshwater wetland management. Habitat management within the diked area would require an intensive, regularly rotating regime of draining, mowing, discing, application of herbicides, and flooding. Existing water sources would need to be supplemented with more pumping and additional water sources. Current freshwater sources might be insufficient to provide the volume of water needed for reed

canary grass control. This alternative component would not meet Refuge goals of restoring native habitats and associated plant and wildlife species, or restoring endangered and threatened species.

- *85% Estuarine Restoration* - Originally considered as part of eight preliminary habitat restoration alternatives during the public scoping process, 85% estuarine restoration would reduce freshwater habitats on the Refuge to approximately 150 acres. This alternative component would limit foot access by the public to a small area. This would make it very difficult to provide a high quality visitor experience while providing sufficient wildlife sanctuary areas in freshwater wetland habitat. In addition, the remaining amount of diked area would provide a limited quantity of freshwater wetland and riparian habitats for freshwater-dependent species.

- *50% Estuarine Restoration in a Different Configuration* - This alternative component would have restored 50% of the diked area to estuary, with a new cross-dike in a different configuration (as compared with Alternative C), angling from the northeast along the Nisqually River, south of the ring dike, down to the southwest, south of Shannon Slough. This would retain more of the Nisqually River dike. This alternative component was not selected because it would only allow a limited water exchange between the restoration area and the Nisqually River, reducing the opportunities for fish, invertebrates, and other wildlife to pass freely. In addition, it would reduce the ability of sediment to reach the restoration area from the major sediment source, the Nisqually River. It would also increase the amount of new cross-dike needed, which would affect the deposition of sediments and salinity patterns in the restoration area (ENSR 1999). It would also have eliminated the riparian restoration zone along the Nisqually River that is part of Alternatives C and D. This dike configuration would have been less effective than Alternative C in restoring estuarine habitat, allowing the Nisqually River to move or flow more naturally, and reducing the need to repair and maintain the dike along the Nisqually River.

- *Acquire State Lands and Close to Waterfowl Hunting* - Acquisition of State lands and closing the Refuge to waterfowl hunting was considered but eliminated because it would have eliminated public waterfowl hunting opportunities in the delta, which is one of the priority public uses on Refuges; in addition, it would not have met WDFW goals and objectives for their lands.

- *Waterfowl Hunting on the East Side of the Nisqually River* - Walk-in waterfowl hunting east of the Nisqually River was considered but not included as an alternative component. This area consists of approximately 400 acres of Refuge and tribal lands, including estuarine and diked habitats. Diked areas will be restored to estuarine and riparian habitats in a phased approach over the next several years, led by the Nisqually Indian Tribe. A loop trail, including bank fishing access, is proposed in Alternatives C and D to offset the trail reduction on the west side of the Nisqually River. The east side parcel is too small to zone or separate multiple uses and provide sufficient wildlife sanctuary and a high quality visitor experience. Certain basic criteria were used to design all alternatives that were not met by this option, including providing sufficient wildlife sanctuary, a 200-yard buffer between hunt areas and trails, and no seasonal trail closures.

- *Waterfowl Hunting Across Entire Tideflats* - An alternative was initially considered that would have created a waterfowl hunting area from bluff to bluff (approximately 924 acres), extending from the western shore of the delta at the Luhr Beach boat ramp east through the entire delta to the eastern boundary of the Refuge. This alternative was not selected for several reasons, including: (1) the large hunting area would have stretched across the entire delta east to west, leaving very little intertidal/salt marsh habitat as undisturbed sanctuary areas for waterfowl; (2) the hunting area would have extended into portions of the estuarine restoration area, conflicting with the common provision in all action alternatives to maintain restoration areas as closed to public access to provide wildlife sanctuary and a research study area, to document processes of estuarine restoration and fish and wildlife responses with minimal human disturbance; and (3) hunting would be an open access, 7 day/week program, in keeping with WDFW lands; this level of hunting activity, in addition to the enlarged hunt area, would provide insufficient waterfowl sanctuary.

- *Waterfowl Hunting in Multiple Sites* - An alternative was considered but not selected that would have retained hunting in all three WDFW parcels and opened more of the Refuge to hunting. It would have included 3 to 4 set blinds and a one-month delayed opening on the McAllister Creek tract, opening the northeastern section of the RNA and the northeastern portion of the restored area to hunting, opening Refuge and tribal lands east of the river for 4 to 6 hunting blinds, requiring seasonal trail closures east of the river. This alternative was eliminated because it would provide insufficient wildlife sanctuary, compromise the RNA to a great degree including areas where wigeon concentrate to rest and feed, conflict with the provision to maintain restored areas as sanctuary and research areas, and would have created a direct conflict with the proposed east side trail, thereby requiring a seasonal trail closure and eliminating zoning or separation of uses.

- *Boardwalk Loop Options in Restored Estuarine Area within Brown Farm Dike* - Boardwalk loops were not included as an alternative component in restored estuarine areas because: (1) loop configurations would affect the quality of the experience by being fully visible from other parts of the boardwalk, interrupting the visual landscape, and affecting wildlife use patterns, thereby decreasing wildlife viewing opportunities for visitors on other portions of the boardwalk; (2) the trail would disturb wildlife in newly restored estuarine areas and fragment restored estuarine habitats; and (3) the logistical difficulties and costs associated with installing and maintaining extensive boardwalks would have been prohibitive in an open, fully tidal system subject to high tides and storms.

- *West Bluff Trail* - The establishment of a new trail on the 100-acre West Bluff parcel was considered. It was not selected as an alternative component because of its proximity to a bald eagle nest. The Recovery Plan recommends an 800-meter buffer (line of sight) from active eagle nests. The trail would have been well within this buffer area. Further, the trail would have been at or above the level of the nest in the nest tree, greatly increasing the potential for human disturbance to nesting or roosting bald eagles. The majority of the parcel was logged in the early 1990s and has since become dominated by Scot's broom. The Service is reforesting the tract, which would greatly increase its value as a corridor for wildlife and a buffer to nesting bald eagles and great blue herons. In addition, public access would have required establishment of a parking area within the reforestation area and access

off a very busy main road, Meridian Drive. Reforestation and wildlife protection were considered the highest priorities for this tract.

- *East Shore Trail* - To provide additional trail linkages within the local area, a new east shore trail was considered along the shoreline below the East Bluff, in the vicinity of the jetty, west of the railroad bed. This trail would have the potential to link up with trails in DuPont. However, further analysis showed that the shoreline was commonly inundated during high tides and was heavily riprapped and extremely steep, making the installation of a trail logistically infeasible. Additionally, the active railroad track would have been very difficult to cross safely to gain access to a trail along the shoreline.

- *Full Study Area Boundary Expansion* - A larger Refuge expansion (5,390 additional acres) was considered but not included because of conflicts with other land uses, high costs, and because some areas were judged to be lower priority for Refuge protection.

This page intentionally left blank.

Table 2.3-1. Comparison of Nisqually NWR CCP/EIS Alternatives by Component.

Plan Features	Alternative A— No Action: Status Quo	Alternative B—Refuge Expansion of 2,407 Acres and Minimum Estuarine Restoration	Alternative C—Refuge Expansion of 2,407 Acres and Moderate Estuarine Restoration	Alternative D—Preferred Alternative: Refuge Expansion of 3,479 Acres and Maximum Estuarine Restoration
REFUGE EXPANSION				
Refuge Boundary	No change in existing approved Refuge boundary. Continue to complete the Refuge, acquiring or protecting lands within the boundary. Improve priority habitat protection in the watershed through strengthened partnerships outside of the Refuge boundary.	Continue to complete the Refuge as in Alternative A, including cooperative management agreement for Luhr Beach area. Expand Refuge boundary (listed below). Strengthen partnerships within the watershed to improve priority habitat protection.	Same as Alternative B.	Continue to complete the Refuge as in Alternative B, but with larger boundary expansion (listed below). Strengthen partnerships within the watershed to improve priority habitat protection.
Acres	No change.	Additional 2,407 acres.	Same as Alternative B.	Additional 3,479 acres.
East Bluff	No proposed acquisition.	Protect 512 acres of a forested corridor along the East Bluff, north of I-5.	Same as Alternative B.	Same as Alternative B.
Nisqually River Valley	No proposed acquisition.	Protect 1,566 acres of freshwater wetland, riparian, and forested habitat.	Same as Alternative B.	Same as Alternative B, but with a total of 1,952 acres protected.
Nisqually River Corridor	No proposed acquisition.	Protect 325 acres of the Nisqually River corridor south of I-5.	Same as Alternative B.	Same as Alternative B, but with a total of 1,011 acres protected.
HABITAT RESTORATION				
Estuarine Habitat	No restoration.	30% muted (318 acres) 15% full (140 acres; Shannon Slough system).	50% full (515 acres) Allow Nisqually River to follow more natural flow.	70% full (699 acres) Allow Nisqually River and McAllister Creek to follow more natural flow.
Freshwater Habitat	1,000 acres Limited management improvements.	542 acres Improved management with 5 new interior management units. Seasonal wetland restoration and management on lands acquired south of I-5.	447 acres Retain Shannon Slough system; improved management with 5 new interior management units. Seasonal wetland restoration and management on lands acquired south of I-5.	263 acres Improved management with 5 new interior management units. Seasonal wetland restoration and management on lands acquired south of I-5.

Table 2.3-1. Comparison of Nisqually NWR CCP/EIS Alternatives by Component.

Plan Features	Alternative A— No Action: Status Quo	Alternative B—Refuge Expansion of 2,407 Acres and Minimum Estuarine Restoration	Alternative C—Refuge Expansion of 2,407 Acres and Moderate Estuarine Restoration	Alternative D—Preferred Alternative: Refuge Expansion of 3,479 Acres and Maximum Estuarine Restoration
Riparian Habitat	Limited riparian plantings north of headquarters and along sloughs within diked areas.	Same as Alternative A with riparian restoration on McAllister Creek and Nisqually River south of I-5.	Same as Alternative B with additional 38 acres of riparian/surge plain restoration along the Nisqually River.	Same as Alternative C.
Exterior Dike (linear feet remaining)	28,000 feet Extensive dike repairs and long-term maintenance required.	A total of 33,800 feet (retain 24,100 feet, new 9,700 feet) Extensive dike repairs and long-term maintenance required. Dike breached and bridged in 5 locations with no filling of borrow ditch.	A total of 15,600 feet (retain 11,000 feet, new 4,600 feet) Extensive dike repairs and long-term maintenance required. Breach and remove dike to grade; fill borrow ditch.	A total of 15,000 feet (retain 3,000 feet, new 12,000 feet) Breach and remove dike to grade; fill borrow ditch.
Interior Dike System	No changes.	13,200 feet 5 diked, freshwater units.	13,000 feet 5 diked, freshwater units.	10,500 feet 5 diked, freshwater units.
Nisqually Tribal Land, east of River	Estuarine restoration on portions of 330 acres, managed by the Refuge under Cooperative Agreement.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
ENVIRONMENTAL EDUCATION				
On-site Program	Continue to provide limited program: (1) reservation system for school groups; (2) trails; and (3) field trip assistance by Refuge volunteers.	Greatly expand and improve program. Develop site-specific materials and curricula, provide teacher training, provide increased field trip support, and serve as a model for other programs.	Expand and improve program. Same program components as Alternative B, but for fewer students.	Same as Alternative C.
Students Served	5000	20000	15000	15000

Table 2.3-1. Comparison of Nisqually NWR CCP/EIS Alternatives by Component.

Plan Features	Alternative A— No Action: Status Quo	Alternative B—Refuge Expansion of 2,407 Acres and Minimum Estuarine Restoration	Alternative C—Refuge Expansion of 2,407 Acres and Moderate Estuarine Restoration	Alternative D—Preferred Alternative: Refuge Expansion of 3,479 Acres and Maximum Estuarine Restoration
Facility(ies)	Replace Environmental Education Center.	Acquire or manage Luhr Beach under cooperative management agreement, including Nisqually Reach Nature Center. Replace Environmental Education Center.	Same as Alternative B.	Same as Alternative B.
Off-site Program	No changes.	Develop and strengthen partnerships in the area.	Same as Alternative B.	Same as Alternative B.
Staffing Needs	No changes	Provide increased staff support.	Same as Alternative B.	Same as Alternative B.
WILDLIFE OBSERVATION, HIKING, AND TRAIL CONFIGURATION				
Dike (main) Trail	Existing 5½-mile dike trail loop would remain.	Existing 5½-mile dike trail loop roughly the same length although revised in configuration around the Shannon Slough system.	Existing dike trail would be reduced to approx. 3¾-mile round trip, including a loop with a boardwalk extension.	3½-mile round-trip trail, including a boardwalk extension into the estuary; no loop configuration.
Twin Barns Boardwalk Loop Trail	Accessible loop trail (1 mile) with interpretive panels remains.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
New Trails	Unimproved, primitive ½-mile trail in Nisqually River surge plain forest.	Same as Alternative A.	Same as Alternative A. Also, new 2½-mile loop trail on tribal and Refuge lands east of the Nisqually River. Possible new trail option on the East Bluff, if acquired.	Same as Alternative C.
Facilities	Visitor Center and interpretive displays, focusing on existing habitats and wildlife.	Same as Alternative A but with additional interpretation on estuarine restoration. A new Visitor Contact Station at Luhr Beach.	Same as Alternative B, plus new Visitor Contact Station and parking on the east side of the Nisqually River.	Same as Alternative C.

Table 2.3-1. Comparison of Nisqually NWR CCP/EIS Alternatives by Component.

Plan Features	Alternative A—No Action: Status Quo	Alternative B—Refuge Expansion of 2,407 Acres and Minimum Estuarine Restoration	Alternative C—Refuge Expansion of 2,407 Acres and Moderate Estuarine Restoration	Alternative D—Preferred Alternative: Refuge Expansion of 3,479 Acres and Maximum Estuarine Restoration
Seasonal Closures	Portion of the 5½-mile loop trail would continue to be closed seasonally during waterfowl hunting season.	Same as Alternative A.	No seasonal closures on main trail. New eastside trail seasonally closed during waterfowl hunting season for the duration of private duck club operation.	A portion of main trail would be closed seasonally during waterfowl hunting season. New eastside trail seasonally closed during waterfowl hunting season for the duration of private duck club operation.
WATERFOWL HUNTING				
Refuge Open to Waterfowl Hunting	No, but unsigned areas administratively uncontrollable. Some hunting occurs on Refuge tidelands, McAllister Creek, and RNA.	No; sign boundaries to delineate Refuge from WDFW lands and enforcement to prevent hunting from occurring on Refuge lands.	Yes; quality hunting on 1,170 acres of Refuge and WDFW lands north of Brown Farm Dike and west of Nisqually River. Quality hunt provisions include 3 days/week; 25-shell limit; no limit on number of hunters and no designated blind sites.	Yes; Refuge will open 191 acres of Refuge lands to a 7 day/week hunt program, creating a single block area with WDFW lands north of the Brown Farm Dike. Quality hunt provision of 25-shell limit on all lands. No limit on number of hunters. Total area available for hunting, including WDFW lands, would be 808 acres.
WDFW Lands	Hunting occurs on 617 acres of WDFW lands; management responsibility by WDFW.	Same as Alternative A.	WDFW and Refuge lands, including Luhr Beach, consolidated and managed by Refuge preferably through a cooperative management agreement. If agreement cannot be reached by Dec. 2004, same as Alternative B.	Same as Alternative A, with quality hunt provision of 25-shell limit.
Acreage Changes	None	None	Refuge opens 713 acres to hunting and WDFW closes 72 huntable acres along McAllister Creek. Reduce RNA by 166 acres.	Refuge opens 191 acres to hunting. Reduce RNA by 73 acres to allow hunting, but add 44 new acres to the south.
Sanctuary	No new sanctuary provided.	Largest amount of sanctuary.	Moderate increase in sanctuary, including McAllister Creek.	Moderate increase in sanctuary.

Table 2.3-1. Comparison of Nisqually NWR CCP/EIS Alternatives by Component.

Plan Features	Alternative A— No Action: Status Quo	Alternative B—Refuge Expansion of 2,407 Acres and Minimum Estuarine Restoration	Alternative C—Refuge Expansion of 2,407 Acres and Moderate Estuarine Restoration	Alternative D—Preferred Alternative: Refuge Expansion of 3,479 Acres and Maximum Estuarine Restoration
Luhr Beach Hunter Access	Hunting and hunter access managed by WDFW.	Same as Alternative A	Hunting and hunter access managed by the Service.	Hunting on Refuge lands managed by the Service; hunting on WDFW lands managed by WDFW.
Staffing Needs	No changes.	Provide increased staff support for enforcement.	Provide maximum increased staff support for management of hunting program and enforcement.	Same as Alternative C.
FISHING				
General Regulations	Fishing would be allowed by boat, following State regulations, in all Refuge waters outside of the dike. The area within the Brown Farm Dike would continue to be closed to fishing.	Fishing would be allowed by boat, following State regulations, in all Refuge waters outside of the dike, except that the RNA fishing closures would be enforced and any tidal restoration area would be closed to fishing.	Same as Alternative B.	Same as Alternative B.
McAllister Creek bank fishing area	No change in area but continued seasonal closures in portions during waterfowl hunting season.	Same as Alternative A.	Same as Alternative A, except no seasonal closures.	Bank fishing along McAllister Creek would no longer be available due to dike removal.
RNA closures	RNA closures would not be enforced.	The RNA would be closed to fishing and closures enforced.	Same as Alternative B.	Same as Alternative B.
New fishing opportunities	None	An improved Nisqually River bank fishing area, if acquired, located south of I-5 (Trotter's Woods area) would be provided. Accessible fishing site at Luhr Beach would be provided if feasible under cooperative management agreement.	Same as Alternative B but with an additional potential bank fishing area along the Nisqually River north of I-5 (on tribal and Refuge lands east of the river).	Same as Alternatives B and C, but an additional option for accessible fishing site at the Nisqually River Overlook from the Twin Barns Loop Trail would be investigated, and new fishing opportunities on McAllister Creek would be explored in expansion areas if acquired.

Table 2.3-1. Comparison of Nisqually NWR CCP/EIS Alternatives by Component.

Plan Features	Alternative A— No Action: Status Quo	Alternative B—Refuge Expansion of 2,407 Acres and Minimum Estuarine Restoration	Alternative C—Refuge Expansion of 2,407 Acres and Moderate Estuarine Restoration	Alternative D—Preferred Alternative: Refuge Expansion of 3,479 Acres and Maximum Estuarine Restoration
BOATING				
General Regulations	No restrictions.	A speed limit of 5 mph would be established in all Refuge waters.	Same as Alternative B.	Same as Alternative B.
RNA closures	RNA closures would not be enforced.	All consumptive uses, including associated boating, would be prohibited in the RNA. In addition, the RNA would be closed to all boating from October 1 to March 31 to provide a seasonal sanctuary for migratory birds and other wildlife.	Same as Alternative B.	Same as Alternative B.
Luhr Beach Boat Ramp Area	None	Manage through a cooperative management agreement to enhance Refuge outreach efforts and provide Refuge boating regulations and general Refuge and wildlife information at a Visitor Contact Station.	Same as Alternative B.	Same as Alternative B.